

SUNIL P. HANGAL

TITLE: Principal

EXPERTISE: Air Quality, Greenhouse Gas Inventory Assessment and Management, Risk Management Planning, Source Sampling and Emissions Control Technology, Pollution Prevention, Environmental Health and Safety Compliance Management, Environmental Impact Assessment/Site Investigation, Wastewater, Solid and Hazardous Waste Management, Environmental Management Systems, Sustainability, Environmental, Health and Safety Compliance and Auditing

EXPERIENCE:

Air Permitting, Compliance, and Auditing

- Involved in preparation and review of over 1,000 air permits in several US states. Types of industries include batch chemical plants, chemical process industries, pharmaceutical manufacturing, research and development, pilot plants, pulp and paper mills, resource recovery facilities, composting plants, sludge processing and incineration facilities, and various manufacturing plants.
- Assisted in development of permitting and compliance strategies, preparation of regulatory impact analysis, and agency negotiations in US and Canada.
- Prepared over two dozen PSD/NSR reviews and permits nationwide
- Agency negotiations for PSD/NSR permits for plant modifications and expansions
- Extensive experience with MACT regulations, implementation and compliance.

Greenhouse Gas Inventory, Assessment and Management

- Contract third party greenhouse gases assessor for SGS International Certification Services, Inc.
- Developed accurate and verifiable greenhouse gases inventory as well as tracking systems for industrial companies.
- Developed management system to obtain and manage accurate carbon equivalent data at industrial companies.
- Developed indirect and direct carbon tracking system for energy reduction activities as well as packaging and transportation across the supply chain.
- Conducted an energy audit for multiple facilities to assess energy savings and carbon footprint reduction opportunities.
- Developed plans for carbon foot printing for industrial companies across the

supply and value chain.

Risk Management Planning

- Developed, implemented and maintained Risk Management Plans (RMP) under both Clean Air Act and New Jersey Toxic Catastrophic Prevention Act (TCPA) at industrial companies including Process Safety Management, operator training, emergency response and accident prevention planning and Inherently Safer Technology Assessment.
- Conducted RMP/TCPA compliance audits

Source Sampling and Emission Control Technology

- Prepared and reviewed source sampling protocols, CEM compliance protocols, and odor sampling protocols.
- BACT/LAER analysis as well as MACT compliance for major facilities including Pharmaceutical and MON MACT.
- Assisted in review of air pollution control options, vendor specifications for control technologies, and cost/benefit analysis for various industries.
- Involved in performance evaluation of various types of air pollution control systems.
- Sponsored by United States Agency for International Development to assess air pollution control systems at foundries near the Taj Mahal in Agra, India.

Air Quality Analysis, Air Quality Monitoring, and Computer Application

- Experienced in operation of USEPA air dispersion models.
- Prepared air quality analysis reports.
- Assisted in design of air quality monitoring networks and in air quality monitoring

Pollution Prevention

- Prepared Pollution Prevention Plans for various industrial sources. Identified various Pollution Prevention options and developed cost-benefit analysis. Assisted with implementation of Pollution Prevention Plans.

Wastewater, Solid and Hazardous Waste Management

- Prepared and reviewed solid waste permits for municipal solid waste composting facilities and resource recovery facilities.
- Prepared NPDES permits, wastewater discharge permits, sewer use permits, groundwater discharge permits, and treatment works approval permits for industrial facilities.
- Evaluated waste disposal and treatment options at several industrial facilities.
- Negotiated effluent trading agreement between pharmaceutical and chemical manufacturing facilities.
- Conducted storm water inspections, prepared storm water management plans, and prepared storm water permits.
- Prepared several spill prevention, control and countermeasure plans and facility response plans.

Research

- Conducted research on sampling efficiency of sampling inlets using a wind tunnel facility.
- Conducted research on performance of venturi scrubbers.

Process Engineering

- Involved with process evaluation of numerous industrial processes to estimate emissions/effluent levels and determine pollution prevention options.
- Worked as a process engineer at a pulp and paper mill.
- Prepared Pre-manufacturing Notice and Exemption Notice applications for new substances under the Toxic Substances Control Act.

Responsible Care and Environmental Management Systems

- Registered environmental management system lead auditor.
- Contract third party ISO14001 and OHSAS 18001 lead auditor for SGS International Certification Services, Inc.
- Worked with different levels of management and production staff at industrial facilities including chemical and pharmaceutical manufacturing in developing system level procedures and documentation for various elements of Responsible Care and Environmental Management Systems including Hazards or aspects evaluation and ranking system, objectives and targets programs, training, operational control programs, emergency preparedness and response, and checking and corrective actions.
- Developed a product stewardship program working with management at a major chemical company.
- Developed EMS audit plans and conducted internal EMS audits at numerous facilities
- Assisted chemical companies in developing and implementing RC/14001 EHS management system programs.
- Managed development and implementation of company- wide OSHAS 18001 program for an industrial company with multiple facilities.

Sustainability

- Developed a plan for carbon life cycle analysis for a textile company for identifying carbon emissions in over 5000 SKUs
- Developed a product stewardship program which included sustainability criteria for products used in electronic manufacturing

Environmental Impact Assessment/Site investigation

- Supervised environmental impact assessment and site investigation at over two dozen industrial and commercial facilities.
- Supervised soil and ground water remediation projects.
- Prepared remedial investigation/feasibility studies, work plans as well as conducted sampling and monitoring for site investigation/remediation projects.
- Supervised site wells installation and sampling activities for site investigation projects.
- Conducted natural resources damage assessments as part of site investigation

- projects.
- Supervised Underground Storage Tanks closures and abandonment in place.
- Conducted due diligence site and operational review for Mergers & Acquisitions.

Environmental, Health and Safety Compliance and Auditing

- Conducted environmental, health and safety compliance audits for over 100 facilities including industrial and R&D facilities in US and Canada
- Developed and managed health and safety programs as well as fire prevention and emergency response plans for industrial facilities including chemical and pharmaceuticals plants, food processing plants and other types of industrial plants.

Environmental, Health and Safety Training

- Provided training in hazardous waste and solid waste management, air quality, waste water treatment and process safety management at numerous industrial companies.
- Provided training on quality assurance/quality control procedures and certification of continuous emission monitoring systems.
- Presented many articles on air pollution, compliance strategies and pollution prevention topics at seminars and international conferences.
- Provided management system training to managers, supervisors, and operators at various industrial facilities.
- Provided training in management system auditing to internal audit teams.
- Provided health and safety training at various industrial and research and development facilities.
- Developed environmental, health and safety training programs for numerous organizations including industrial, research and development as well as distribution and retailing companies.

PROFESSIONAL BACKGROUND:

- ECAM, Bedminster, NJ. Principal. Nov 2007 –
- RTP Environmental Associates, Inc., Green Brook, New Jersey. Senior Scientist/ Senior Project Manager/Principal. 1991 – Oct 2007
- Aerosol Research Laboratory, University of Cincinnati. Cincinnati, Ohio. Research Assistant.
- Air Resources Engineering Laboratory, University of Texas at Dallas. Richardson, Texas. Research Assistant.
- Bhadrachalam Paperboards, LTD, India. Process Engineer.

ACADEMIC BACKGROUND:

- Ph.D., Environmental Hygiene Science and Engineering, University of Cincinnati
- M.S., Environmental Engineering, University of Texas at Dallas.
- B.S., Chemical Engineering, University of Mysore, India.

PROFESSIONAL AFFILIATIONS:

- Air and Waste Management Association.
- Past Chairman of American Institute of Chemical Engineers, New Jersey Section.
- Sigma Xi.

SELECTED PUBLICATIONS AND PRESENTATIONS:

- Aspiration Efficiency: Unified Model for all Forward Sampling Angles, Environmental Science and Technology, May, 1990.
- Overall Efficiency of Tubular Inlets Sampling at 0 to 90 Degrees from Horizontal Aerosol Flows, Atmospheric Environment, November, 1990.
- Respirator Fit and Protection through the Determination of Air and Particle Leakage, The Annals of Occupational Hygiene, 1991.
- Aerosol Sampling at Small Forward Facing Angles: Differentiation of Yaw and Pitch Sampling, Atmospheric Environment, July, 1992.
- Saving the Taj Mahal from Air Pollution, Air & Waste Management Association Annual Meeting, Toronto, Canada, June, 1997.
- Grouping of Combustion Sources for Maximum Operational Flexibility, Air & Waste Management Association Annual Meeting, Salt Lake City, Utah, June, 2000.
- Planning for the Future – A Balance between Regulatory Risks versus Market and Production Requirements at Ophthalmic Lens Coating Facility, American Institute of Chemical Engineers Spring National Meeting, New Orleans, Louisiana, April 2003.
- Accurate and Verifiable Greenhouse Gas Emissions, American Institute of Chemical Engineers Virtual Meeting, February 2007.
- TSCA/REACH Workshop, National association of Chemical Distributors, Arlington, VA, October 2007.
- Benefits of Implementing an Environmental Management System, NJWEA, Atlantic City, NJ, April 2008.
- Preparing for Potential Greenhouse Gas Legislation, American Institute of Chemical Engineers National Conference, Philadelphia, November 2008
- Trials and Tribulations in Estimating Accurate and Verifiable Greenhouse Gas Emissions, National Environmental Partnership Summit, San Francisco, May 2009.
- Balancing between MACT Compliance and Production Requirements, American Institute of Chemical Engineers Conference, San Antonio, March 2010.
- Trials and Tribulations in Conducting a Carbon Lifecycle Analysis, Auditing Roundtable, Philadelphia, September 2010.
- Use of Nanotubes for VOC Control, American Institute of Chemical Engineer Conference, Minneapolis, November 2011.